Skin-Sparing Mastectomy With Immediate Tissue Reconstruction

BREAST CANCER is frequently treated with breast-conserving techniques, including lumpectomy, axillary dissection, and radiation therapy. Mastectomy with lymph node dissection remains the treatment of choice in many patients, however. To facilitate patient acceptance of this recommendation, skin-sparing mastectomy and immediate transverse rectus abdominis myocutaneous (TRAM) flap reconstruction were developed in 1991. This procedure satisfies oncologic requirements and provides superior reconstructive results compared with conventional techniques.

The proper surgical treatment of breast cancer requires the removal of the nipple-areolar complex and previous biopsy scars in the process of mastectomy. Previously an elliptical incision was designed to satisfy these criteria. This provided for a straight-line closure when no reconstruction was done but produced a distinctly patchwork appearance when immediate tissue reconstruction was performed. Because patients increasingly seek immediate reconstruction and express a greater preference for reconstruction with their own tissue, newer methods were sought that would improve the results while maintaining strict oncologic standards.

Of note, several reviews have determined that immediate myocutaneous flap breast reconstruction results in no significant differences in patient survival and in the detection of recurrences when compared with mastectomy alone. Patients may also undergo radiation therapy if necessary after this type of reconstruction.

Technically, skin-sparing mastectomy involves the same-thickness skin flaps as in a conventional modified radical mastectomy but is performed through a limited incision that is dictated by the position of previous biopsy scars. The natural inframammary crease is preserved. Axillary dissection may be done through a separate transaxillary incision. The result is a completed mastectomy with all breast tissue removed and an empty breast skin envelope. The removed skin is then replaced with abdominal skin. The remaining skin is removed from the TRAM flap, which is placed in the breast envelope as a living implant. The flap therefore settles into the breast's natural contour, resulting in a superior aesthetic shape that closely resembles the natural breast.

From 1993 to the present, we have performed skin-sparing mastectomies with TRAM flap reconstruction on 31 patients at the University of Washington Medical Center (Seattle). We select patients for immediate reconstruction who are unlikely to require irradiation and who are anticipated to have fewer than three positive lymph nodes. Of the 31 patients, 5 underwent bilateral skin-sparing procedures. Of the total of 36 TRAM flaps thus performed, 12 were transferred microsurgically as free TRAM flaps and 24 by standard pedicled techniques. All flaps healed without serious complications, and no patients sustained delays in further treatment because of problems related to their reconstructions.

Skin-sparing mastectomy with immediate autogenous reconstruction provides superior results to traditional techniques and improved patient satisfaction while maintaining all appropriate oncologic principles for surgical resection. This provides an excellent treatment of patients when breast-conserving techniques are not applicable. This technique is not appropriate when the immediate reconstruction is performed with implants and should not be applied when the mastectomy is done for recurrence in an irradiated breast following unsuccessful breast-conserving therapy.

RICHARD P. RAND, MD
DAVID R. BYRD, MD
BENJAMIN O. ANDERSON, MD
ROGER MOE, MD
Seattle, Washington

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Thromboembolism Prophylaxis in Surgical Patients

VENOUS THROMBOEMBOLISM continues to be a major cause of morbidity and mortality in surgical patients and those who have survived severe injury. Deep venous thrombosis (DVT) occurs in 19% to 25% of patients being treated surgically and in more than 50% of trauma patients. Currently symptomatic pulmonary embolism develops in 1% to 2% of trauma patients and, of these, 25% to 50% die. Those at highest risk of thromboembolism are patients undergoing major thoracic or abdominal operations; those suffering fractures of the spine, pelvis, or lower extremities; or patients older than 30 years. Because of the common occurrence of thromboembolic complications in surgical patients, it is important that surgeons have an effective approach to their prevention.

Available methods of thromboembolism prophylaxis include pharmacologic (heparin), mechanical (sequential compression devices and foot pumps), and surgical (caval filters). Heparin therapy is currently the standard. Both the mechanical and the surgical methods of prophylaxis are used when heparin therapy is contraindicated or has failed.

Several heparin regimens are used widely: low-dose heparin (5,000 units administered subcutaneously twice or three times a day), adjusted-dose heparin (enough to raise the partial thromboplastin time [aPTT] 5 seconds

above normal), and unmonitored low-molecular-weight heparin (30 mg given subcutaneously twice per day).

Both unfractionated (standard) and low-molecular-weight heparin exert their anticoagulant effect through the potentiation of antithrombin III. Therefore, for any heparin regimen to be effective in preventing thrombosis, the patient must have adequate antithrombin III levels. We and others have recently shown that the majority of severely injured patients have antithrombin III levels that are substantially depressed. Therefore, the patients at highest risk for thromboembolism have low antithrombin III levels.

In the past decade, the approach of progressively adjusting the heparin dose to maintain the aPTT above normal (adjusted-dose heparin) has been shown to be superior to the low-dose approach in preventing venous thromboembolism. Adjusting the heparin dose compensates for the depleted antithrombin III levels. An important note is that the increased doses of heparin used with this method have not been shown to result in more or worse bleeding complications.

A new group of heparin products, low-molecular-weight heparins, has recently captured great interest. These are standard heparins that have been subjected to a fractionation process to yield a purer compound with a higher concentration of the subunit responsible for the potentiation of antithrombin III. The important differences between standard and low-molecular-weight heparins are that low-molecular-weight heparins have a longer half-life, a more dependable absorption, a more potent effect on antithrombin III, and may be less likely to incite heparin-induced thrombocytopenia. Despite these possible advantages, a considerable disadvantage of the low-molecular-weight heparins is that most laboratories are unable to monitor their anticoagulant effect. As with standard heparin, low-molecular-weight heparin in the absence of adequate antithrombin III is doomed to fail at preventing thromboembolism.

Several low-molecular-weight heparins are available in Canada, and now there are two in the United States. These products are protected by patents, and so their manufacturers have an interest in sponsoring research to promote them. But the majority of current low-molecular-weight heparin efficacy trials have compared the use of low-molecular-weight heparin with that of placebo and low-dose heparin rather than with adjusted-dose heparin. The trials that have compared the use of low-molecular-weight heparin with that of adjusted-dose heparin have failed to show that administering low-molecular-weight heparin further reduced the overall incidence of DVT. The low-molecular-weight heparin regimens have DVT rates of 12% to 16% in surgical patients and 30% in severely injured patients. This failure to prevent DVT is most likely the result of an inadequate heparin effect due to antithrombin III depletion. Until monitoring of low-molecular-weight heparin becomes more feasible, this failure will persist.

In summary, for patients undergoing a major operation or who are severely injured, we recommend the following measures. Patients without specific contraindications to heparin should be given enough heparin to maintain their aPTT 5 seconds above normal (adjusted dose). Those patients who have a contraindication to heparin and are at a low to moderate risk for thromboembolism should have a mechanical method of prophylaxis used. Those patients with contraindications to heparin who are at high risk should have a caval filter placed.

JOHN T. OWINGS, MD
Sacramento, California

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